

OBSERVATIONS ON THE FOULING CHARACTERISTICS OF FOUR BRYOZOANS IN COCHIN HARBOUR

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The occurrence of the 4 species of bryozoans under study showed that *Electra crustulenta* PALLAS and *Victorella pavida* KENT are brackish water forms, *Electra bengalensis stoliczka* and *Schizoporella cochinchensis* Menon and Nair are typical marine forms. It is interesting to note the seasonal succession of these species in Cochin Harbour correspond to the distribution of salinity in this area.

INTRODUCTION

Scheer (1945) brought to light the important ecological role of the bryozoan community in the sequence of settlement of the marine sedentary organisms. Kuriyan (1950, 1952), Daniel (1954), Iyengar et al (1957) Ganapathi et al (1958), Antony Raja (1959), Balasubramanyan et al (1963), Nair (1971) observed fouling bryozoans in their studies on fouling organisms. However, systematic studies on Indian bryozoans were initiated by Menon (1967) and Nair (1967, 1969, 1970a, 1970b, 1970c & 1971).

While conducting studies on fouling organisms at Cochin Harbour (lat. 9° 58' N, long. 76° 17'E) the author had opportunities to observe the settlement of four species of bryozoans. These animals exhibited quite interesting characteristics in their settlement.

MATERIAL AND METHODS

The bryozoans were allowed to freely settle on smooth glass panels (150 X 100 X 3 mm) arranged on to a grooved wooden rack and exposed subtidally one foot below low waterline from the Institute test

site (Balasubramanyan and Menon, 1963). The panels were examined periodically and the intensity of settlement noted by counting the number of colonies. Hydrological conditions such as surface water temperature and salinity were recorded (Table-1). Based on the distribution of salinity, the year was divided into pre-monsoon (Jan - April) monsoon (May - August) and post monsoon (September - December).

DISCUSSION

Electra Crustulanta PALLAS, *Electra bengalensis* STOLICZKA, *Schizoporella cochinchensis* MENON & NAIR 1971, *Victorella pavida* KENT were the four species of fouling bryozoans found settling on panels during the various periods. The settlement data of the first three species were statistically analysed and the average, standard deviation and 95% confidence interval for the mean were worked out (Table II).

Electra crustulanta PALLAS was found settling on panels during July, August, September, October, November and December. They were absent during the other parts of the year. The peak settlement

Table I
HYDROCHLORICAL CONDITIONS OF THE TEST SITE

Month	Surface water temperature °c			Surface salinity ‰		
	Min.	Max.	Av.	Min.	Max.	Av.
January	27.2	31.0	28.4	28.0	34.3	33.47
February	28.5	31.2	29.7	30.7	34.86	33.2
March	30.4	32.0	30.9	29.0	32.27	30.27
April	30.0	31.0	30.9	31.5	34.0	32.77
May	30.5	31.0	30.8	24.5	32.4	27.7
June	27.8	29.9	28.6	6.2	25.8	15.67
July	27.2	28.8	28.0	1.2	6.61	3.13
August	28.0	28.8	28.8	1.20	3.28	2.19
September	26.8	29.2	26.8	1.56	5.62	3.74
October	27.0	31.4	28.9	2.6	12.12	7.61
November	27.3	29.4	28.2	2.70	20.8	11.38
December	27.0	28.4	27.65	13.20	31.80	23.09

of this species was in July followed by September and August. There was also a minor peak during November and settlement ceased by December. Thus settlement was confined to monsoon (May to August) and post monsoon (Sept. to Dec.) periods. The comparatively low salinity prevailing during this period may be a conducive factor for the settlement of this species. During the occurrence of this species the average salinity varied from 2.19‰ to 23.09‰ (Table I). The peak settlement of this species occurred at an average salinity of 3.13‰ in July. *Electra crustulanta* appears to be a typical euryhaline form colonising the estuary during the low saline conditions existing during the monsoon and post monsoon months.

Electra bengalensis STOLICZKA was noticed only during March, April, May and June with a peak in March at an average salinity of 30.27‰. (Table II) i. e. during the first half of the pre-monsoon period. The reduction in number during May and June may be due to reduction in salinity or due to paucity of larvae as suggested by Menon and Nair (1971b).

Electra bengalensis may be a typical marine form colonising the estuary only during the high saline conditions of the pre-monsoon period.

Schizoporella cochinensis Menon & Nair found settling during February to May (Premonsoon) and were totally absent during other periods. Their maximum settlement was in May, when the salinity varied from 24.5 to 32.4‰. From the nature of occurrence this also appears to be a typical marine form.

Victorella pavidata KENT settled only during the monsoon and post-monsoon periods, namely, June, July, August, September, October, November and December. No settlement was noticed during other months. Peak settlement was in October. As observed by Menon and Nair (1967b) "the settlement of this species in this locality indicates that the months most favourable for settlement are those when the salinity of the surrounding water is not high". The period June to Dec. forms the monsoon and post-monsoon months and are periods of comparatively low salinity. As also noted by Menon and Nair (loc. cit) high salinity of the medium is

Table II

Electra crustulenta PALLAS

Month	Min. No. of colonies	Max. No. of colonies	Average	Standard deviation	95% confidence interval	Min- salinity ‰	Max. Salinity ‰	Average	Standard deviation ‰	95% confidence interval ‰
July	41	201	99	39.90	(81-117)	1.02	6.61	3.13	2.14	(2.19 - 4.08)
August	22	56	37	12.00	(28-46)	1.20	3.23	2.19	0.56	(1.79 - 2.59)
September	31	54	41	8.96	(34-49)	1.56	5.62	3.74	1.84	(2.20 - 5.28)
October	3	29	13	8.47	(8-18)	2.60	12.12	7.61	1.69	(6.58 - 8.63)
November	14	107	38	23.87	(23-53)	2.70	20.8	11.38	6.33	(7.36 - 15.4)
December	2	15	7	3.81	(5-9)	13.20	31.8	23.09	5.61	(19.98 - 36.2)
<i>Electra bengalensis stolizka</i>										
March	22	46	36	7.21	(32-40)	29.0	32.0	30.37	0.96	(29.78 - 30.76)
April	5	37	25	8.09	(20-30)	31.5	34.0	32.77	0.71	(28.51 - 37.03)
May	2	10	6	2.46	(4-7)	24.5	32.4	27.72	2.61	(25.86 - 29.58)
June	1	25	7	8.94	(1-13)	6.2	25.8	15.67	9.07	(9.58 - 21.76)
<i>Schizoporella cochinchensis</i> (Menon & Nair)										
February	1	15	5	3.94	(2-7)	30.7	34.3	33.47	1.00	(32.87 - 34.07)
March	2	25	14	9.75	(5-23)	22.7	33.6	31.40	3.90	(27.80 - 34.99)
April	1	42	33	26.49	(0-66)	32.0	33.8	33.14	0.79	(32.15 - 34.13)
May	1	120	48	32.74	(16-79)	30.0	33.2	31.74	2.17	(30.07 - 33.41)

Table III

Victorella Pavida KENT

Month	Panel No.	Rating	Month	Panel No.	Rating	Month	Panel No.	Rating
June	1	R	Sept.	1	R		6	C
	2	R		2	C		7	C
	3	R		3	VC		8	C
	4	R		4	C		9	VC
	5	R		5	C		10	VC
July	1	VC	Oct.	1	A			
	2	C		2	A			
	3	C		3	A			
	4	C		4	A			
	5	C		5	A			
	6	A		6	A			
	7	VC		7	A			
	8	C		8	A			
	9	C		9	A			
	10	R		10	A			
	11	C		11	C			
	12	R		12	R			
	13	C		13	VC			
	14	R		14	VC			
	15	R		15	R			
	16	R	Nov.	1	R			
	17	R		2	C			
	18	R		3	C			
	19	R		4	VC			
August	1	A		5	C			
	2	VC		6	C			
	3	VC		7	C			
	4	A		8	R			
	5	VC		9	R			
	6	R		10	VC			
	7	C		11	C			
	8	R	Dec.	1	C			
	6	C		2	C			
	10	C		3	A			
	11	C		4	C			
	12	VC		5	R			

Key: R - Rare (below 5 colonies)
 C - Common (between 5 & 25)
 VC - Very common (between 25 & 30)
 A - Abundant (above 50)

unfavourable for the settlement growth and survival of this species". *Victorella pavida* appears to be brackish water form like *Electra crustulenta* and it can tolerate low salinities and even fresh water conditions.

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